Research Title:

Prevalence and causes of bed sores in bedridden of Atbara and Ad-Dammar Hospitals from December 2019 To February 2020

A thesis submitted as partial fulfillment of requirement of degree in BSc nursing science

Prepared by:

Abdulwahab Gusmallah

Ashraf Sadeg Nasser

Awad Gusmalsed Fdoley

Omar Ezzeldeen

Osman Mohammed Ahmed

Supervised by:

M.S.N: Nagia Mohammed Shams Aldeen

بسم الله الرحمن الرحيم

قال تعالى:

(وَتَحْسَبُهُمْ أَيْقَاظًا وَهُمْ رُقُودٌ ۚ وَنُقَلِّبُهُمْ ذَاتَ الْيَمِينِ وَذَاتَ الشِّمَالِ ۖ وَكَلْبُهُمْ بَاسِطٌ ذِرَاعَيْهِ بِالْوَصِيدِ ۚ لَوِ اطَّلَعْتَ عَلَيْهِمْ لَوَلَّيْتَ مِنْهُمْ فِرَارًا وَلَمُلِئْتَ مِنْهُمْ رُعْبًا (١٨)

سورة الكهف:آية{18} صدق الله العظيم

Dedication

Just to
Who have taught us a lot through the life
Who trained us how I can change to better
Dear Father
To
Who taught us what is the meaning of life ,dried our tears and filled our hearts with delight
Dear Mother

To
The deepest feeling who supported us always teach us to give even without take
dear Brothers and Sisters
To
Who lead us to the way of success
Our teachers
To
Our friends and Colleagues

Acknowledgment

All thanks to Allah from start to the end…

And pray for prophet

Mohamed peace of Allah

Be upon him

We would like to acknowledge the

Contribution of our

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Who guide us throughout our way and helped us to make this research as accurate and useful as possible.

And to all those who contributed their time and helped us

Abstract

Back ground: Bed sores are ischemic lesion of skin and underline tissue, caused by external pressure that impairs the flow of blood and lymph, the ischemia causes tissue necrosis and eventual ulceration, this ulcer called ‘’bed sores decubitus, ulcer or pressure ulcer. Bed sore are classified by the depth of tissue damage. The staging of bed sore including stages1, 2, 3 and 4 (Assessment of nurses knowledge regarding prevention of bed sores in Elmak Nimer university hospital: Zainab E.)

Objective*:* To determine prevalence and causes of bed sore in bedridden patient

***Method*:** This analytical cross-sectional study aim to assess prevalence and causes of bed sore in river Nile state (Atbara and Ad-Damir hospital) during period from (November – February) 2019 – 2020.

Result*:* The data managed by SPSS. According to study (sample size =70 people), the prevalence of bed sore in Atbara and Ad-Damir hospital was found to be 22.9%

The prevalence of first, second, third and four degree bed sore was 18.8, 12.5, 31.3, and 37.5 respectively. The most common site of bed sore was sacral (43.8) and the causes of bed sore among inadequate mobilization , weak sensory perception , poor nutrition ,and after surgery patient was (40 , 33.3 , 20 , 6.7) respectively .

Conclusion*:* High prevalence of stage 3 and stage 4 of bedsores were detected in Atbara and Ad-Damir hospitals, so special protocols are needed to decrease the prevalence of bedsore. Also its show there is a big correlation between bedsores and bedridden Patients age (most common in elderly)

Recommendation*:* This study is recommended that Hospital manger, head nurse and senior nurse have to encourage training course regarding knowledge of bed sores. Provide hospitals with equipment (air mattress).The health care staff should provide co-patients with full information about method of prevention and care of bedridden patients even if patient will discharge to the home.

الخلفية

القرح السريرية هي قرح نقص التروية الدموية نتيجة لقلة معدل سريان الدم اللتي يسببها الضغط الخارجي للنسيج مما يسبب تلف النسيج وموته

القرح السريرية تصنف علي حسب تلف النسيج الي اربع مراحل

الاهداف

تحديد معدل حدوث وانتشار القرح السريرية واهم اسبابها في المرضي طريحي الفراش بمستشفيات الدامر وعطبرة التعليميين بولاية نهر النيل جمهورية السودان.

طريقة الدراسة

الدراسة عبر الاقسام التحليلية

النتيجة:

اثبتت الدراسة وجود القرح السريرية بمستشفيات عطبرة والدامر التعليميين في المرضي طريحي الفراش بنسبة 22,9% وكانت الاسباب التالية هي الاكثر شيوعا بين المرضي .

عدم او قلة الحركة،قلة الاحساس ، قلة التغذّية واقل نسبة كانت بين المرضي بعد العمليات الجراحية بنسب متتالية

الخلاصه:

اكبر ظهور للقرح السريرية كان المرحلتين الثالثة والرابعة وكانت اكثر الاسباب قلة او انعدام الحركة كما يظهر في الغالب من كبار السن

التوصيات:

وجهنا توصياتنا للجهات الحكومية ومديري المستشفيات بضرورة توفير المعدات اللازمة بالرعاية بمريضي القرح السريرية

كما وجهنا توصياتنا للممرضين بضرورة معرفة الاسباب وتفاديها والوقاية منها وضرورة نشر الوعي بين مرافقي المرضي وفئات المجتمع المختلفة

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INTRODUCTION

Bed sores are ischemic lesion of skin and underline tissue, caused by external pressure that impairs the flow of blood and lymph, the ischemia causes tissue necrosis and eventual ulceration, this ulcer called ‘’bed sores decubitus, ulcer or pressure ulcer (Burke. e t, al 2008). Bed sores tend to develop over a bony prominence such as heel, greater trochanter, sacrum, but they appear on skin of any part of body subject to external pressure, friction or sharing forces (Burke.. e t al, 2008).

Factor that influence the development of bed sores include amount of pressure ‘’ intensity, length of time the pressure is extended on the ‘’duration ‘’and ability of patient tissue to tolerate the external applied pressure. Bed sores have been associated with an extended length of hospitalization, sepsis and mortality, and prevalence of bed sores in health care facilities is increasingly. (Bucher.. e t al, 2011).

Bed sores incidence rate very concededly by clinical setting ranging from (0.4%- 30%) in acute, from (2.2%-23.9%) in long term care, and from (0%-7%) in home care (www.icsi.org; 1;30pm)

The prevalence rate between 5% and 10% of hospitalization patient about 15% of resident of long term care facilities (Burcher. et al 2011).The cost of bed sore treatment is 2.5 time higher than prevention , thus nursing goals should be goad toward prevention in order to achieve bed sores prevention goals, nurse should properly identified bed sores and document all element of the ulcer to monitor and track it’s progress .(www.awma.com.au /;12;12pm).
(Assessment of nurses knowledge regarding prevention of bed sores in Elmak Nimer university hospital: Zainab E.)

OBJECTIVES

General objectives:

To determine prevalence and causes of bedsores in Atbara and Ad-Damar hospitals in River Nile state from December 2019 To February 2020

Specific objectives:

To determine prevalence of bed ulcer
To determine common causes of bed ulcer
To determine the relation of pressure ulcer with aging and gender

Research Problem

Pressure ulcers are one of the most complications that appear in bedridden patients whose staying in hospital for long period of time.
Therefore the development of pressure ulcers leads to other health problems such as wounds, and infections that need immediately medical intervention.
Pressure ulcers considered as health, money, and time consumer
Pressure ulcer is a serious condition that affects superficial tissue in pressured area and when it not treated immediately may go worth and affect muscles, bone and nerve tissue which can lead to infection, sepsis and death

Justification

This study will attempt to determine prevalence and common causes of bed sores and gather information about causes to prevention from bed sore

And improve health system and describe associate between pressure ulcer and aging

Literature review

Pressure ulcer:

Pressure ulcer is a wound with a localized area of tissue necrosis. Depending on the depth of the ulcer, a pressure ulcer may be an acute wound or a chronic wound. The underlying cause is pressure.

Most pressure ulcers develop when soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time, or when soft tissue undergoes pressure in combination with shear and/or friction (Hess, 2008; National Pressure Ulcer Advisory Panel [NPUAP], 2007c). The terms "decubitus ulcer," "pressure sore," and "bedsore" are also used to refer to this type of wound. {Fundamentals of Nursing THE ART AND SCIENCE OF NURSING CARE 7th edition}

The term "pressure ulcer" is considered the most appropriate term because pressure is the most prominent underlying cause.

Risk factors:

Most pressure ulcers occur in older adults as a result of a combination of factors, including aging skin, chronic illnesses, immobility, malnutrition, fecal and urinary incontinence, altered level of consciousness, populations at risk include individuals with spinal cord injuries, traumatic brain injuries, and neuromuscular disorders,{ National Pressure Ulcer Advisory Panel [NPUAP] }.

Prevalence of pressure ulcer:

Pressure ulcers have been recognised for hundreds of years; their presence has even been documented in Egyptian mummified bodies (Clarke M &. The nursing prevention of pressure sores in hospital and community patients.). Since the late 1960s, pressure ulcers have had a high profile in health professional journals. Despite the plethora of research and acquired knowledge, the occurrence of pressure ulcers remains a problem in today's health care setting

In the USA a recently published national survey reported a pressure ulcer prevalence 10.1 percent across 265 acute care hospitals (39,874 inpatients) (Barczak C,Fourth national pressure ulcer prevalence survey).

The pressure ulcer prevalence of each hospital ranged from 1.4 per cent to 36.4 percent. However, the aggregate prevalence was consistent with previous surveys: 11.7 per cent in 1993 (Meehan M . National pressure ulcer prevalence survey), and 9.2 per cent in 1989 (Meehan M. Multisite pressure ulcer prevalence survey).

Pressure ulcer prevalence higher than those cited above have been reported in subpopulations of individuals: 60 per cent in hospitalised quadriplegics (Richardson RR... Prevalence and incidence of pressure sores in acute spinal cord injuries. Paraplegia); 66 percent in elderly individuals
{Australian wound management Association}

Stages of pressure ulcer:

The first indication that a pressure ulcer may be developing is blanching (becoming pale and white) of the skin over the area under pressure.
This ischemia makes the skin appear paler than in areas where circulation is adequate. When pressure is relieved, ischemia is rapidly followed by hyperemia. Reactive hyperemia is a blanchable reddening of the skin that occurs when pressure is removed. The body literally floods the area with blood to nourish and remove wastes from the cells. The area appears red and feels warm, but blanches when slight pressure is applied.

Reactive hyperemia is not a pressure ulcer. After a patient who has been lying supine for 2 hours is repositioned onto the side, any reddened area due to reactive hyperemia should fade within 60 to 90 minutes.
In patients with darkly pigmented skin, it may be best to assess for hyperemia by touch; the skin feels warm. Also, assess for some change in color relative to the surrounding skin. If the pressure continues after ischemia occurs, circulation is further impaired and a pressure ulcer develops. Appropriate intervention depends on early recognition of the stage of development of the pressure ulcer. Pressure ulcers are commonly classified according to six stages (four numbered and two unnumbered)—suspected deep-tissue injury, stage I, stage II, stage III, stage IV, and unstagable .
Suspected deep-tissue injury presents as purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. It may initially present as a painful, firm, mushy, boggy, warmer, or cooler area as compared to adjacent tissue (NPUAP, 2007c). {Fundamentals of Nursing THE ART AND SCIENCE OF NURSING CARE 7th edition}

Stage I pressure ulcer:

Is a defined area of intact skin with nonblanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding skin. The area may be painful, firm, soft, warmer, or cooler as compared to adjacent tissue (NPUAP, 2007c).

Stage II pressure ulcer:

Involves partial thickness loss of dermis and presents as a shallow, open ulcer (NPUAP, 2007c).

Stage III pressure ulcer:

Present with full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon, or muscle is not exposed. Slough that may be present does not obscure the depth of tissue loss.
May include undermining and tunneling(NPUAP, 2007c).

Stage IV pressure ulcers:
Involve full thickness tissue loss with exposed bone, tendon, or muscle. Slough or eschar may be present on some part of the wound bed and often include undermining and tunneling.
Pressure ulcers are classified as unstageable when the base of the ulcer is covered by slough (yellow, tan, grey, green, or brown) and/or eschar (tan, brown, or black) in the wound bed. Eschar is a thick, leathery scab or dry crust that is necrotic (dead tissue) and must be removed before the stage can be determined accurately. However, stable (dry, adherent, intact, without erythema or fluctuance) eschar on the heels serves as "the body's natural (biological) cover" and should not be removed (NPUAP, 2007c).

PATHOPHYSIOLOGY OF PRESSURE ULCERS:
The factors causing pressure ulcers are separated into two major groups:
• ***Intrinsic***: Factors from within the body such as disease/ comorbidities, medications, poor nutrition, age, dehydration/fluid status, poor mobility, incontinence, suppleness, and weight.
• ***Extrinsic***: The external influences that cause skin damage or changes such as pressure, shear, friction, or moisture.
These factors put stress on the skin, causing it to fail.
Capillaries and arterioles within the skin are important to provide the skin with viability and oxygenation. The average mean capillary pressure equals about 17 mmHg and any external pressures exceeding this will cause capillary obstruction.
Tissues that are dependent on these capillaries are deprived of their blood supply. Eventually the tissue will become ischemic and die (Waterlow, 2009). This is what happens when there is pressure on a bony prominence for prolonged periods.
The blood supply is diminished and the area above the pressure does not get sufficient oxygen and dies.
Shearing forces will only exist if pressure, usually caused by the person's own body weight, is also present. Shearing forces occur when a part of the body tries to move but the surface of the skin remains fixed. Shear alone does not cause a pressure ulcer but may cause the epidermis or dermis to slough as in a skin tear. Shear in combination with friction, pressure, or moisture causes a pressure ulcer. Friction is actually caused by the body's resistance to movement and causes increased pressure in combination with shear.

Moist skin from perspiration and incontinence in combination with the other forces can cause a pressure ulcer. Moisture also can cause the skin to become macerated. This type of skin appears moist, often white and frail. Macerated skin also is more susceptible to friction and shear. Moist skin is different than incontinent-associated skin damage. Such damage occurs because of the high caustic nature of urine and feces. The damage can be devastating but is not the same as a pressure ulcer and will be discussed in more detail in later chapters. It is evident that pressure ulcers are caused by multiple factors. The damage caused to skin and delicate tissues can be devastating. It is much less expensive to prevent the damage than to treat it. The rest of this book will focus on assessment, prevention, and treatment {FAST FACTS ABOUT PRESSURE ULCER CARE FOR NURSES,, Mary Ellen}

Aetiology pressure ulcers:

Pressure ulcers occur when soft tissue is compressed between a bony prominence and an external surface for a prolonged period of time (National Pressure Ulcer Advisory Panel. Pressure). Pressure ulcers may involve any of the following tissue: epidermis, dermis, subcutaneous fat, muscle and bone (Bridel J. The aetiology of pressure sores), (Cohen IR, ... Wound Healing: Biochemical and Clinical Aspects).

Pressure can be defined as a perpendicular load or force exerted on a unit of area (Bennett L & Lee BY.Pressure versus shear in pressure sore causation). When a prolonged pressure is applied to a localised area of tissue (point pressure), the result can be occlusion of blood flow causing tissue ischemia and reperfusion injury. Both ischemia and reperfusion injury ultimately contribute to cell destruction and tissue death(Sousido R … et al. Histopathology of pressure ulcers as a result of sequential computer controlled pressure sessions in a fuzzy rat model). Pressure can also force fluid out of the interstitial space, causing cell to cell contact. This results in membrane rupture and the release of toxic intracellular material. The removal of toxic substances is hampered by the destruction of local lymphatic vessels, contributing to tissue necrosis (Krouskop TA A synthesis of the factors that contribute to pressure sore formation).

The critical determinants of pressure ulcer development are:

1. The intensity and duration of pressure, and
2. The tolerance of the skin and its supporting structures for pressure (Braden B … A conceptual scheme for the study of the etiology of pressure sores).

Capillaries have little resistance to direct external pressure. A threshold of 32 mmHg is widely quoted (Brooks B… Effects of pressure on tissues), (Kosiak M. Etiology and pathology of ischemic ulcers), (Landis E. Micro-injection studies of capillary blood pressure in human skin), (Trumble HC. The skin tolerance for pressure and pressure sores) as the point at which intracapillary pressure is overcome, resulting in capillary collapse. An absolute value for capillary closing pressure has been disputed. Factors such as collagen content of the dermis and auto regulation mechanisms of microcirculation have been

hypothesised as factors which influence the threshold for capillary collapse (Bridel J. The aetiology of pressure sores), (Bennett ...Pressure versus shear in pressure sore causation), (Holstein P,…Blood flow cessation at external pressure in the skin of normal limbs).

Collagen plays an important role in preventing disruption to the microcirculation. In response to pressure, collagen maintains the hydrostatic and oncotic pressures, buffering the interstitial fluid from the external force and preventing cellular destruction (Reddy NP, .. & Newell PH. Biomechanics of lymphatic vessel, Blood Vessels).

However, the collagen content of the dermis alters with disease, age, spinal cord injury and the use of steroids, affecting the capacity of the dermis to buffer external pressure (Krouskop TA. A synthesis of the factors that contribute to pressure sore formation), (Barbenel JC, ... Major pressure sores), (Claus-Walker J, … & Chapman M. Electrolytes in urinary calculi and urine of patients with spinal cord injuries).

External pressures below capillary closing pressure may also cause damage to the deep tissues closer to bony prominences where pressures have been demonstrated to be three to five times greater than at the skin surface (Le K, Madsen B, …..& Vistnes L. An in-depth look at pressure sores using monolithic silicon pressure sensors) Damage to deeper structures may be more extensive than damage to underlying skin. In addition, while lower pressures may not close capillaries they may reduce blood flow by obstructing the venous capillaries which have a pressure of 6 – 12 mmHg. This may also contribute to tissue ischemia and necrosis {Clinical Practice Guidelines for the Prediction and Prevention of Pressure Ulcers, Australian Wound Management Association}

Assessment

Assessment begins with identifying those at risk for pressure ulcer development and developing a plan to prevent pressure ulcer formation. If a pressure ulcer develops, assessment focuses on staging pressure ulcers and developing and evaluating pressure ulcer treatment plans. Lesions may also be categorized according to their pattern, configuration, and distribution (Particia ,e t a l ;2007).

Provide an ongoing assessment of the status of the pressure ulcer, as well as underlying causes and impediments to healing, monitor for risk factors such as prolonged immobility, incontinence, and inadequate hydration and nutrition. Use transparency film or a disposable ruler to measure the diameter of the ulcer in centimeters .depth can be measured with a cotton-tipped applicator. Also, gently probe a cotton-tipped applicator under the skin edges to detect tunneling and measure lateral tissue destruction. There are several different staging systems for pressure sores based on the depth of tissue destroyed. In general, the staging systems are categorized from I to IV. (Particia, etal; 2007}

Braden Scale for Predicting Pressure Sore Risk:

- **Sensory Perception**: Ability to respond meaningfully to pressure-related discomfort

I. Completely Limited: Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation, OR limited ability to feel pain over most of body surface.

II. Very Limited: Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness, OR has a sensory impairment which limits the ability to feel pain or discomfort over half of body.

III. Slightly Limited: Responds to verbal commands but cannot always communicate discomfort or need to be turned, OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.

IV. No Impairment: Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.

- **Moisture**: Degree to which skin is exposed to moisture

1. Constantly Moist: Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.
2. Very Moist: Skin is often but not always moist. Linen must be changed at least once a shift.
3. Occasionally Moist: Skin is occasionally moist, requiring an extra linen change approximately once a day.
4. Rarely Moist: Skin is usually dry: linen requires changing only at routine intervals.

- **Activity**: Degree of physical activity
    a) Bedfast: Confined to bed.
    b) Chair fast: Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.
    c) Walks Occasionally: Walks occasionally during the day, but for very short distances, with or without assistance .Spends majority of each shift in bed or chair.
    d) Walks Frequently: Walks outside the room at least twice and inside room at least once every 2 hours during waking hours.
- **Mobility**: Ability to change and control body position

i. Completely immobile: Does not make even slight changes in body or extremity position without assistance.
ii. Very Limited: Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.
iii. Slightly Limited: Makes frequent though slight changes in body or extremity position independently.
iv. No Limitation: Makes major and frequent changes in position without assistance.

- **Nutrition**: Usual food intake pattern

a. Very Poor: Never eats a complete meal. Rarely eats more than 1/3 of food offered .Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly .Does not take a liquid dietary supplement, OR is NPO and/or maintained on clear liquids or IV for more than five days.
b. Probably Inadequate: Rarely eats a complete meal and generally eats only about half of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement, OR receives less than optimum amount of liquid diet or tube feeding.
c. Adequate: Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement if offered, OR is on a tube feeding or TPN regimen, which probably meets most of nutritional needs.
d. Excellent: Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.

- **Friction and Shear**

1. Problem: Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures, or agitation leads to almost constant friction.
2. Potential Problem: Moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.
3. No Apparent Problem: Moves in bed and in chair independently and has sufficient muscle strength to lift up completely

Risk Level

19-23 Not at risk
15-18 low risk
13-14 moderate risk
10-12 high risk
≤ 9 very high risk

NPO: Nothing by Mouth
IV: Intravenously
TPN: Total parenteral nutrition
3 or 4 = Moderate to Low Impairment
Total Points Possible: 23
Risk Predicting Score: 16 or Less
{Barbara Braden and Nancy Bergstrom} {Fundamentals of Nursing THE ART AND SCIENCE OF NURSING CARE}

Complication:

Although non-infectious complications of pressure ulcers occur, systemic infections are the most prevalent.

Non-infectious complication include amyloidosis, heterotopic bone formation, perineal–urethral fistula , pseudoaneurysm , marjolin ulcer, and systemic complication of topic treatment .Infectious complication include bacteremia and sepsis , cellulitis ,endocarditis, men-or abscesses(Treatment of pressure ulcer .Rockville) .Osteomyelitis has been reported in 17 to 32 present of infected ulcer and may lead to no healing ulcers with or without systemic manifestations (Farouche RO, London GC, Klima M, Musher DM, Murkowski J.) plain radiographs and bone scans are often unreliable.

Magnetic resonance imaging has 98 present sensitivity and 89 present specificity for osteomyelitis in patient with pressure ulcer (Huang AB, … WG. 1998) ; however , needle biopsy of the bone (via orthopaedic consultation) is recommended can guide antibiotic therapy.

Bacteremia may occur with or without osteomyelitis, causing unexplained fever tachycardia, hypotension, or altered mental status (Bryan CS, Dew CE, Reynolds KI. Bacteraemia associated with decubitus ulcers).

Overall mortality is high with both condition(Wall BM, Mangold T, Huch KM, Corbett C, Cooke CR. 2003) and empirical antibiotic pending culture result should cover merhicillin resistant sataphylococus aureus anaerobes, enterococci ,and gram negative organisms, such as pseudomonas, proteus, and providencia species (Livesley NJ, Chow AW. Infected pressure ulcers in elderly individuals 2002)

Prevention:

There are many interventions for the prevention of pressure ulcers. Assess and document the condition of the skin daily , so all are aware of developing problems. Gently cleanse the skin daily with tepid water and mild soap to prevent drying.
To reduce friction, pat the skin dry rather than rubbing it dry .After bathing, daily lifelong lubrication of the skin with moisturizers is important to prevent dryness. Thoroughly dry skin-to-skin surfaces, such as under the breasts, skin folds (especially in the groin and abdominal folds), and between the toes, to prevent prolonged exposure to moisture
If incontinence is a problem, clean the skin promptly with tepid water and mild soap, pat dry, and apply a moisture barrier to prevent breakdown (Linda, e t a l ;2007).
Avoid massaging bony prominences or reddened skin areas; research has shown that blood vessels are damaged by massage when ischemia is present or when they lie over a bone. Teach patients to shift their weight every 15 minutes if possible when lying or sitting. When the patient is immobile, the highest possible level of mobility should be maintained; frequent active or passive range-of-motion exercises should be performed, as well as turning according to a written repositioning schedule. If patients are on bed rest, turn and reposition them at least every 2 hours, but preferably more often because ischemia development begins after 20 to40 minutes of pressure. The head of the bed should not be elevated more than 30 degrees to reduce pressure on the coccyx, and to reduce friction and shear damage from sliding down in the bed (Linda, e t a l ;2007).
When positioning patients on their side, place them at a 30-degree angle or less and not directly on the trochanter because this area is especially sensitive to pressure and can quickly break down. If patients are placed on the trochanter, they usually become restless and squirm around to get off the trochanter. If the patient is seated in a chair, repositioning every hour is important. A mobility program specific to the patient must be developed. The patient's heels should not rest on the bed surface. They should be elevated off the bed with pillows placed lengthwise under the calf or with heel elevators. Take care so pressure is not applied on the calf from the pillows (Linda, e t a l ;2007).

Be sure to also protect the patient's elbows, sacrum, scapulae, ears, and occipital area from pressure .Donut-shaped cushions should never be used. They create a circle of pressure that cuts off the circulation to the surrounding tissue, promoting ischemia rather than preventing it. Pad skin contact surfaces, especially bony prominences, so they do not press against each other. (For example, place a small pillow between the knees when the patient is in a side-lying position.) Provide an appropriate pressure-relieving or pressure-reducing mattress and chair cushion for immobile patients. To avoid friction, use a sheet to lift and move patients; provide an over bed trapeze to assist patients to move themselves. Prevent malnutrition and dehydration by ensuring an adequate intake of protein, calories, and fluid; provide 2500 mL of fluid each day if not contraindicated by other medical problem (Linda, e t a l ;2007).

In the well-nourished patient, pressure ulcers can usually be prevented by implementing the following measures, Maintain adequate nutritional and hydration status ,Do not allow skin to remain in contact with plastic, nylon, or waterproof surfaces (Brenda ; 2004) .

Avoid the use of adhesives such as tape on pressure prone areas or on red or broken skin ,Keep the skin clean and well moisturized; although it, is important to remove urine or fecal material from the skin immediately, older people do not need dailies baths, Avoid the use of drying soaps, alcohol, and iodine on the skin ,Rinse the skin well when soap is used ,Pat rather than rub skin dry after bathing to avoid friction, Remove fallen food particles from the bed after each meal (Brenda ; 2004) .

Keep the bed free of personal articles such as combs, brushes, or hairpins, Change position frequently; every 1 to 2 hours is ideal. Lift and do not pull or drag extremities when repositioning to avoid friction on skin, use a draw or lift sheet for moving heavy parts of the body, Perform daily range of motion exercises to promote circulation. Use pressure-reducing support surfaces such as pillows and air, water, or gel-filled mattresses to avoid pressure on bony prominences, avoid use of rubber donut-shaped support devices, which may impair circulation ,avoid the use of irritating straps on heel or elbow protectors, do not massage bony prominences as this could damage delicate skin and/or capillaries(Brenda ; 2004) .

Interventions to Prevent Skin Breakdown:

Avoid the use of soap and water on dry skin areas, use a moisture barrier cream or ointment on dry skin areas before bathing to protect the skin from the drying effects of water, clean and dry areas between toes, use perineal cleansing products to cleanse urine and feces residue from the perineum and anal areas, these products are specially designed to break down and facilitate the complete removal of urine and feces without irritating the skin, use moisturizing creams that have no alcohol or perfume, which can irritate the skin, avoid areas of skin pressure, especially over bony areas, by assisting the older adult to change

positions on a regular schedule ,assess skin for areas of redness. If redness occurs, the positioning schedule should be more frequent (Brenda, 2004). Keep fingernails short, use pillows and pads to help maintain alignment with position changes. Use specialized mattresses and chair cushions designed to decrease pressure, Keep the patient's heels off the bed with pillows under the calves for support and to prevent pressure ,encourage the older adult to be out of bed and active throughout the day (Brenda ,2004).

Remember to assess skin and reposition frequently even when out of bed, because areas of pressure occur whether the patient is in or out of bed, remind the patient to change position or shift weight frequently while sitting in a chair to avoid prolonged pressure provide a high-protein vitamin-rich diet if not contraindicated (Brenda ,2004).

Therapeutic Interventions:

For existing pressure ulcers, continue use of the measures cited above and implement the following: Assess and record the following characteristics of ulcer initially and at scheduled intervals: width, length, depth drainage or exudates odor condition of surrounding tissue, Clean ulcer with saline and remove necrotic tissue b irrigating with a prescribed solution, Keep a moist dressing over the ulcer to prevent complete drying that may result in bleeding and disrupt newly forming capillaries, Monitor for and report signs of infection such as fever, purulent drainage, or redness and swelling of tissue surrounding the ulcer (Brenda, 2004).

Treatment varies according to the size, depth, and stage of the pressure ulcer, as well as special needs of the patient and health-care provider preference. All pressure must be removed from the affected area for healing to occur, cleanliness must be maintained. Basic treatment includes debridement, cleansing, and dressing of the wound to provide a moist and healing environment. (Linda, e t a l ;2007).

Debridement:

Debridement is the removal of dead or nonviable tissue from a wound to help clean up the wound and facilitate formation of granulation tissue. It may be done surgically or nonsurgically.

Nonsurgical debridement includes mechanical, enzymatic, and autolytic methods. Surgical debridement is used only if the patient has sepsis or cellulitis, or to remove extensive eschar.

Eschar is a black or brown hard scab or dry crust that forms from necrotic tissue. It may hide the true depth of the wound and must be removed for the wound to heal (Linda, e t a l ;2007).

Mechanical debridement:

Scissors and forceps can be used for mechanical debridement to selectively debride nonviable tissue. Dextranomer beads, another method of mechanical debridement, may also be sprinkled over the wound to absorb exudates and all other products of tissue breakdown, as well as surface bacteria. Whirlpool baths

and wet-to-dry saline gauze dressings may also be used for mechanical debridement (Linda, e t a l ;2007).

For wet-to-dry dressings, the wet gauze is placed directly on the wound (avoiding surrounding healthy tissue) and allowed to dry completely. The drying process causes the gauze to adhere to the wound; when it is pulled off, tissue is pulled off with it. This results in nonselective debridement because viable tissue may also be removed in this process. These methods are painful, so the patient should be premeditated for pain and assessed frequently. (Linda, e t a l ;2007).

Enzymatic debridement :

Enzymatic debridement involves the application of a topical debriding agent. These agents vary as to application methods, so careful reading of instructions is necessary. Most of these debriding agents are proteolytic enzymes that selectively digest necrotic tissue. Be careful to keep them off of healthy tissue. (Linda, e t a l; 2007).

Autolytic debridement :

Autolytic debridement is the use of a synthetic dressing or moisture-retentive dressing over the ulcer. The scar is then self-digested via the action of the enzymes that are present in the fluid environment of the wound. This method is not used for infected wounds (Linda, e t a l; 2007).

Surgical debarment:

Surgical debridement is the removal of devitalized tissue, slough, or thick, adherent. (Linda, e t a l; 2007).

METHODOLOGY

1. **Study design:**

Cross sectional study

2. **Study area:**

This study was done carry out in Sudan -River Nile state - Atbara and Ad-Dammar cities

Atbara is located in northeastern Sudan at (17.70) latitude and (33.99)longitude and it is situated 358 meters above sea level 310 km far from the capital Khartoum city at the junction of the river Nile and Atbara river Ad-Dammar is the capital of the River Nile state in Sudan ,at an elevation of 353 meters above sea level, about 250 km northeast of Khartoum (www.worldatlas.com , Wikipedia)

3. **setting:**

The Study were conducted in Atbara and Ad-Damir educational hospitals, located in River Nile State, Republic of Sudan

4. **Study population:**

Any patients admitted and hospitalized for at least 7 days in Atbara and Ad-Dammar educational hospitals during study time

5. **Sample Size:**

Total coverage during study time

6. **Inclusion Criteria:**

All ages above twenty years

7. **Exclusion criteria:**

Patients younger than 18

8. **Sample:**
   Any patients admitted in Atbara and Ad-Dammar educational hospitals whom being hospitalized for at least 7 days
9. **Data collection tool**

Data was collected through an Interview and observation ***questionnaire*** and filled by the participants.

10. **Data analysis and storage**

Data analyzed by using computer through SPSS program to show the results as percentage, pie, and charts

Ethical consideration:

- Permission to carry out the study was taken from the El-Sheik Abdulah Elbadri University, Atbara and Ad-Dammar hospital .
- Explain the procedure to patient.
- The objectives of the study were known by patient & their acceptance was considered.

Result

Frequency Table

This table No (4-1): Show that distribution of participant in Atbara and Ad-Dammar hospitals (N=70)

Hospital		Frequency	Percent
Valid	Atbara	36	51.4%
	Ad-Dammar	34	48.6%
	Total	70	100.0%

The number of participant from Atbara was (36), and (34) from Ad-Dammar hospital (almost equal)

This table No (4-2): Show distribution of participant in hospitals wards

Ward		Frequency	Percent
Valid	Medicine	54	77.1%
	Surgical	6	8.6%
	ICU	10	14.3%
	Total	70	100.0%

The more common distribution was in medicine word (77.1) more than three quarter, but in ICU word was (14.3) and the lowest ward was surgical (8.6)

This table No (4-3): Show distribution of participants ages

		Frequency	Percent
Valid	25-50 years	13	18.6%
	51-75 years	36	51.4%
	76-100 years	21	30.0%
	Total	70	100.0%

The common grade among (51-75 year) more than half and their percent was (51.4) ,but among (76-100year)was (30%) and between (25-50year) was less common (18.6)

Table No (4-4): show the participants' gender

		Frequency	Percent
Valid	Male	41	58.6%
	Female	29	41.4%
	Total	70	100.0%

The male persons in the study sample were greater than females, males were (58.6%) and the females were (41.4%)

Table No (4-5) : show the distribution of participants according to their medical diagnose

		Frequency	Percent
Valid	Respiratory	17	24.3%
	Cardiovascular	22	31.4%
	CNS	3	4.3%
	Musculoskeletal	5	7.1%
	Infection	17	24.3%
	Other	6	8.6%
	Total	70	100.0%

The common medical diagnose was cardiovascular (31.4), respiratory was (24.3) , infection was (24.3) ,other (8.6) , musculoskeletal was (7.1) and CNS (4.3)

Table No (4-6): show distribution of participants according to their weights

Weight		Frequency	Percent
Valid	Thin	32	45.7%
	moderate	33	47.1%
	Fat	5	7.1%
	Total	70	100.0%

The common weight is moderate in less than half of paricipants (47.1%), thin weight (45.7%) , and the fat is less common (7.1%)

Table No (4-7): show distribution of participant according to their skin integrity

Skin integrity		Frequency	Percent
Valid	healthy	27	38.6%
	Dry	40	57.1%
	Moist	3	4.3%
	Total	70	100.0%

The most common type of skin noticed was dry in greater than half of participants which percent is (57.1%) , healthy (38.6%) , and the less common is moist (4.3%)

Table No (4-8): show distribution of participant according the presence of bed sore

Presence		Frequency	Percent
Valid	Yes	16	22.9%
	No	54	77.1%
	Total	70	100.0%

About (22.9%) or less than a quarter of participant have abed sore and (77.1) or three quarters are free of condition

Table No (4-9): show the distribution of the participant according to their length of hospitalization

Length		Frequency	Percent
Valid	less than week	2	2.9%
	a week	19	27.1%
	more than week	45	64.3%
	Total	66	94.3%
Missing	System	4	5.7%
Total		70	100.0%

The most common length of stay was more than week in above of half cases in precisely (64.3%) , a week (27.1%) and less than week uncommon (2.9%)

Table No (4-10) : describe the location of bed sore

Location		Frequency	Percent
Valid	Sacral	7	10.0%
	Heel	1	1.4%
	Elbow	1	1.4%
	Shoulder	5	7.1%
	Others	2	2.9%
	Total	16	22.9%
Missing	System	54	77.1%
Total		70	100.0%

The most common location is sacral (43.8) ,shoulder (31.3) ,other (12.5) , elbow (6.3) ,and heel (6.3)

Table No (4-11): show the distribution of bed sore according to their appearance

Appearance		Frequency	Percent
Valid	red area	1	1.4%

	Blistered	4	5.7%
	Opened	6	8.6%
	Blanked	5	7.1%
	Total	16	22.9%
Missing	System	54	77.1%
Total		70	100.0%

The most common appearance is opened (37.5, blanked (31.3) , blistered (25.0) , and less common is red area (6.3)

Table No (4-12): describe the stage of bedsores

Stage		Frequency	Percent
	stage1	3	4.3%
	stage2	2	2.9%
Valid	stage3	5	7.1%
	stage4	6	8.6%
	Total	16	22.9%
Missing	System	54	77.1%
Total		70	100.0%

The most common stage of bedsores is stage 4 more than third cases in percent of (37.5%), stage 3 (31.3%), stage 1(18.8%) and stage2(12.5%).

Table (4-13): describe the distribution of common causes of bedsores

Cause		Frequency	Percent
	inadequate mobilization	6	8.6%
Valid	poor nutrition	3	4.3%
	after surgery	1	1.4%
	weak sensory perception	5	7.1%
	Total	15	21.4%
Missing	System	55	78.6%
Total		70	100.0%

The most common cause of bedsores is inadequate mobilization in (40%) of cases ,weak sensory perception (33.3%) , poor nutrition (20%) and the less common (6.7%)

Table (4-14): describe the type of nursing intervention

Intervention		Frequency	Percent
Valid	Dressings	1	1.4%
	topical application	2	2.9%
	all intervention	10	14.3%
	no intervention	2	2.9%
	System	15	21.4%
Missing	Total	55	78.6%
Total		70	100.0%

The most common nursing intervene is application of all intervention (66.7) , topical application (13.3) , dressing is (6.7), and about (13.3)of patient with no intervention

Age * presence of pressure ulcer

Table No (4-15) explain the relationship between age and presence of bed sore
Count

Age		presence of pressure ulcer		Total
		Yes	No	
Age	25-50 years	1	12	13
	51-75 years	5	31	36
	76-100 years	10	11	21
Total		16	54	70

The presence of the bed sore is more common among grade between (51-100) , and it's not common in age under grade of(25-50)

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	10.640[a]	2	.005
Likelihood Ratio	10.129	2	.006
Linear-by-Linear Association	8.690	1	.003
N of Valid Cases	70		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.97.

Gender * presence of pressure ulcer

table No (4-16): explain the relation between gender and presence of bed sores

Crosstab

Count

		presence of pressure ulcer		Total
		Yes	No	
Gender	male	8	33	41
	female	8	21	29
Total		16	54	70

This table show there is no relation between gender and presence of bed sores (occur equally in both sex)

Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.628[a]	1	.428		
Continuity Correction[b]	.254	1	.615		
Likelihood Ratio	.622	1	.430		
Fisher's Exact Test				.565	.305
Linear-by-Linear Association	.619	1	.431		
N of Valid Cases	70				

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.63.

b. Computed only for a 2x2 table

Tests of Homogeneity of the Odds Ratio

	Chi-Squared	df	Asymp. Sig. (2-sided)
Breslow-Day	.000	0	.
Tarone's	.000	0	.

Discussion:

This study was conducted to assess prevalence and causes of bed sore in river Nile state (Atbara and Ad-Damir hospital) during period from (November – February) 2019 – 2020.

The point-prevalence of bed sore was 22.9% in this study of 70 patients from two teaching hospitals (Atbara and Ad-Dammar).

According to 14 studies (sample size= 5973 people), the prevalence of bedsores in Iran was found to be 19% (Confidence interval 95%: 13 to 25), (***Prevalence of Bedsore in Iran: A Systematic Review and Meta-analysis*****)**

In comparing that result with our result we found it slightly lower prevalence due to the difference between sample sizes in both researches.

The point-prevalence of pressure ulcers was 18.5% in this study of 672 patients from three university teaching hospitals in Ireland **(Prevalence of pressure ulcers in three university teaching hospitals in Ireland)**

The prevalence of pressure ulcers at the São Paulo Hospital (sample size 376 inpatient) was found to be 11.4% in June 2004 and 10.3% in October 2004 (average 10.9%) in Brazil (**Prevalence of Pressure Ulcers in a Brazilian Hospital)**

In comparing these three researches results with our research result we found a higher prevalence in our study and that may be due to our small sample size

The location of bed sores in sacrum (43.8), heel (6.3), elbow (6.3), shoulder (31.3) and buttock (12.5) in Atbara and Ad-Dammar hospital. The commonest

sites of single pressure ulcers were sacrum (n = 32), buttocks (n = 23) and heel (n =5) in Ireland. The most common site of bedsore was sacrum (54%) in Iran.

2005 survey data the most location of pressure ulcer was the sacrum (28.3%) flowed by heel (23.6%)and buttock(17.2) (**Results of Nine International Pressure Ulcer Prevalence Surveys 1989 to 2005**)

The cause of bed sores inadequate mobilization (40%), poor nutrition (20%), after surgery (6.7%) and weak sensory perception (33.3) in Atbara and Ad-Dammar hospitals.

The prevalence of bed sores among brain disease, motor impairment and coma patient was (25%), (19%) and (46%), respectively in Iran.

The prevalence of bed sores in intensive care unit (ICU) ward (14.3) in Atbara and Ad-Dammar hospital.

The prevalence of bed sores in Dutch ICU is high in the national prevalence survey it was only passed by that geriatric ward (prevalence 39%) (**Prevalence, risk factors and prevention of pressure ulcers in Dutch intensive care units , ,Springer-Verlag 2001**)

The relationship between age and presence of bed sores: the age (25-50years) 1.42%, (51-75years) 7.14% and (70-100years) 14.28% in Atbara and Ad-Dammar hospitals.

The 2005 survey included 39,889 men and 44,797 women. The average age of all patients surveyed was 65.3 years. The majority of patients (78%) with identified pressure ulcers are age 61 years and above 64% of all patients surveyed were >61 years old.

Conclusion

The point-prevalence of bed sore was 22.9% in this study of 70 patients from two teaching hospitals (Atbara and Ad-Dammar) in River Nile state, common causes of bedsores are immobilization, weak sensory perception and poor nutrition.

Also its show there is a big correlation between bedsores and bedridden

Patients age (most common in elderly)

Recommendation

Provide hospitals with equipment (air mattress)

The health care staff should provide co-patients with full information about method of prevention and care of bedridden patients even if patient will discharge to the home

The health care staff should know the necessary of early assessment of bedridden patients for prevention of sore

Provide information about diet and vitamins needed for the health of skin

Also turning and position change improve the tissue perfusion and help in preventing the sore.

Provide society with full information about causes of bedsore and method of prevention

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Questionnaire

Prevalence and causes of bedsores

1. Hospital:
   Atbara ( ) Ad-Dammar ( )
2. Ward:
   Medicine ( ) Surgical ( ) ICU ( ) CCU ( )
3. Age:
   25-50 Years ( ) 51-75 years ( ) more than 76 years ( )
4. Gender :
   Male ( ) female ( )
5. Admission diagnosis:
   Respiratory ( ) Cardiovascular ( ) CNS ( ) Musculoskeletal ( ) Infection ( ) Digestive ( ) Other ( )
6. Weight:
   Thin ( ) moderate ( ) fat ( )
7. Skin :
   Healthy ( ) dry ( ) moist ( )
8. Presence of bedsores:
   Yes ( ) No ( )
9. Length of hospitalization:
   Less than week ( ) a week ( ) more than week ( )
10. Location of sores :
    Sacral ( ) Heel ( ) Elbow ( )

Shoulder ( ) Occiput ( ) buttock ( ) others ( )

11. Appearance of Sores:

Red area ( ) blistered ( ) opened ( ) blanked ( )

Scratch ( )

12. Stage of Bedsores:

Stage 1 ( ) Stage 2 ( ) Stage 3 ( ) Stage 4 ( )

13. Causes of bedsores :

i) Inadequate mobilization ( )
ii) Poor nutrition ( )
iii) After surgery ( )
iv) Weak sensory perception ( )
v) Fecal and urinary incontinence ( )

14. Nursing intervention to treat bedsores:

i) No care for pressure area ( )
ii) Dressings ( )
iii) Air mattress ( )
iv) Topical application ( )